

WHAT IS CLAIMED IS:

1. A fabrication method of a semiconductor device comprising the steps of:
introducing impurities into a first insulation film,
and
5 effecting planarization by polishing a surface of said first insulation film after said impurities are introduced.

2. A fabrication method of a semiconductor device comprising the steps of:

forming a first insulation film on a substrate,
forming a second insulation film on said first
5 insulation film,

introducing impurities at least to a surface of said first insulation film either before or after forming said second insulation film, and

10 effecting planarization by polishing at least said second insulation film.

3. The fabrication method of a semiconductor device according to claim 2, wherein said step of planarization comprises the step of effecting planarization by polishing said first and second insulation films.

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according to claim 2, wherein said first insulation film includes a silicon oxide material containing at least 1% of carbon.

5 9. The fabrication method of a semiconductor device according to claim 2, wherein said first insulation film includes a material having a contact angle of not more than 30° of purified water with respect to said first insulation film.


10. The fabrication method of a semiconductor device according to claim 2, wherein said first insulation film includes an inorganic SOG film.


11. The fabrication method of a semiconductor device according to claim 2, wherein said polishing is carried out by chemical mechanical polishing.

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12. The fabrication method of a semiconductor device according to claim 11, wherein a surfactant is used in said polishing step.


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13. The fabrication method of a semiconductor device according to claim 2, wherein said step of introducing impurities comprises the step of introducing impurities


~~into said first insulation film by implantation.~~


~~12/~~
14. The fabrication method of a semiconductor device according to claim 13, wherein said impurities include at least one element selected from the group consisting of argon, boron, nitrogen and phosphorus.

15. A fabrication method of a semiconductor device comprising the steps of:
forming a first insulation film on a substrate,
introducing impurities at least to a surface of said
5 first insulation film, and
effecting planarization by polishing said first insulation film.


~~16. The fabrication method of a semiconductor device according to claim 15, wherein said step of introducing impurities comprises the step of introducing impurities only to a surface of said first insulation film.~~

17. The fabrication method of a semiconductor device according to claim 15, further comprising the step of forming a third insulation film on a surface of a device after said polishing.

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according to claim 15, wherein a surfactant is used in said polishing step.

24. The fabrication method of a semiconductor device according to claim 15, wherein said step of introducing impurities comprises the step of introducing impurities into said first insulation film by implantation.

25. The fabrication method of a semiconductor device according to claim 15, wherein said impurities include at least one element selected from the group consisting of argon, boron, nitrogen and phosphorus.

26. The fabrication method of a semiconductor device comprising the steps of:

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forming a first insulation film on a substrate,
forming a second insulation film on said first

5 insulation film, and

effecting planarization by polishing at least said second insulation film by chemical mechanical polishing using an abrasive liquid including a surfactant.

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27. The fabrication method of a semiconductor device according to claim 26, wherein said surfactant includes a fatty acid compound.

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4. The fabrication method of a semiconductor device according to claim 2, wherein said second insulation film includes a silicon oxide film formed by plasma CVD.

5. The fabrication method of a semiconductor device according to claim 2, wherein said step of introducing impurities comprises the steps of

5 Sub 5/17 forming a photoresist on a surface of a device before impurities are introduced to said first insulation film, and

introducing impurities into said first insulation film via said photoresist film.

6. The fabrication method of a semiconductor device according to claim 2, further comprising the step of

Sub B1 forming a third insulation film on a surface of a device after said polishing.

7. The fabrication method of a semiconductor device according to claim 2, further comprising the step of forming a fourth insulation film on a surface of a device before said first insulation film is formed.

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18. The fabrication method of a semiconductor device according to claim 15, further comprising the step of forming a fourth insulation film on a surface of a device before said first insulation film is formed.

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19. The fabrication method of a semiconductor device according to claim 15, wherein said first insulation film includes a silicon oxide material containing at least 1% of carbon.

20. The fabrication method of a semiconductor device according to claim 15, wherein said first insulation film includes a material having a contact angle of not more than 30° of purified water with respect to said first
5 insulation film.

21. The fabrication method of a semiconductor device according to claim 15, wherein said first insulation film includes an inorganic SOG film.

22. The fabrication method of a semiconductor device according to claim 15, wherein said polishing is carried out according to chemical mechanical polishing.

23. The fabrication method of a semiconductor device

15 28. The fabrication method of a semiconductor device according to claim 26, further comprising the step of introducing impurities into said first insulation film after said polishing step.

29. An abrasive liquid including at least a surfactant used for a chemical mechanical polishing process.

30. The abrasive liquid according to claim 29, wherein said surfactant includes a fatty acid compound.

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